Population Perinatal Risk Index for New Jersey Municipalities

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Background

Historically the Department of Health and Senior Services has provided state funding to improve perinatal public health services in communities with the worst birth outcomes. Such efforts require a method for ranking municipalities across an array of indicators.

In 1985, the *New Jersey Infant Mortality Reduction Initiative* was launched to reduce infant mortality by reducing low birth weight and very low birth weight births, increasing the early utilization of prenatal care, and reducing the number of adolescent pregnancies. Services supported under this initiative have included grants for comprehensive prenatal care to high risk mothers at six perinatal centers; a statewide telephone hotline for prenatal and WIC referrals; increased community-based outreach and education services; and an extensive public media education and awareness campaign.

The original needs assessment included 63 municipalities with population over 30,000. These communities were rated on a score that combined fetal and infant mortality, low birthweight, poverty and teen births in a weighted sum. In 2002 the MCH Epidemiology Program conducted an updated needs assessment using a *population risk scoring* methodology.

The new approach capitalizes on three observations: [1] New Jersey communities exhibit a diverse array of demographic profiles; [2] demographic risk factors have strong effects on birth outcomes; and [3] because the adverse outcomes we track tend to have the same risk factors, municipalities tend to be equally "at risk" for all those outcomes. Thus municipalities with similar composition with regard to race, education, etc. will have similar values on such varied measures as perinatal death rates, low birth weight, and teen pregnancy.

The population risk scoring methodology increases the validity and stability of community assessments. Our outcomes of primary interest—infant death, fetal demise, low birth weight—are rare events, subject to considerable random fluctuation even in samples of moderate size. The population risk approach yields more stable estimates of risk for small area analysis, because it is less sensitive to random fluctuations in these rare events.

Methods

For the current update, all births, fetal deaths and infant deaths recorded for New Jersey residents by the Office of Vital Statistics from 1999 to 2003 were included in our analysis. We analyzed 146 municipalities with 1,000 or more births in that five year period. See the appendix for cases and indicators available.

The *population risk scoring* procedure starts with the selection of primary indicators:

- low birth weight
- infant mortality
- perinatal (fetal+neonatal) mortality
- late prenatal care
- births to teens.

We use logistic regression to isolate the population component from these five indicators. The procedure includes four steps:

1. A separate regression equation for each birth outcome estimates the effect of race, Hispanic origin, foreign birthplace of mother, parity, mother's age, marital status and education for all births statewide.

2. Each equation generates expected probabilities for individual birth outcomes.

3. Averaging those probabilities yields the municipality's *expected rate* for each outcome, five *population risk components*.

4. To combine the five risk components, we used principal components factor analysis to obtain a weighted, standardized composite score.

Assessment of Results

Exhibit 1 presents the municipal-level correlations of the primary outcomes (plus preterm birth, for interest) with the population risk components (step 3). The correlations ranged from 0.61 to 0.95. Lower correlations would be expected between the rarer mortality events and other outcomes.

Exhibit 2 presents the correlations among the individual risk model components, illustrating the principle that the risk factors have parallel effects on all outcomes.

A single-factor principal components model fits the community variation very well. As shown in Exhibit 3, each expected rate contributes about equally to the composite that we call the *population risk index*.

Summary of Findings

Scores for the *population risk index* and primary outcome indicators are presented in Table 1. The index is tabulated for all 146 municipalities, sorted from highest to lowest overall risk.

Twenty-four municipalities have scores greater than 1.0, which would be the 83rd percentile of risk in a theoretical normal distribution. These municipalities represent eleven of New Jersey's 21 counties, and include all eleven cities designated as target sites under the Infant Mortality Reduction Initiative. The twenty-four had an average fetal-neonatal death rate of 1.9%, and an average of 9.5% low birthweight infants (born less than 2,500g), 58% and 48% above the statewide averages, respectively.

Exhibit 1: Correlation of Population Risk Components with Outcome Indicators, N = 146

population risk components	outcome indicators					
	fetal+neonatal death	low birthweight	preterm birth	infant mortality	teen birth ratio	late prenatal care
fetal+neonatal death	0.72	0.89	0.84	0.67	0.81	0.83
low birthweight	0.73	0.93	0.86	0.69	0.85	0.89
infant mortality	0.74	0.92	0.86	0.71	0.90	0.89
late prenatal care	0.65	0.83	0.79	0.66	0.93	0.95
teen birth ratio	0.61	0.77	0.73	0.66	1.00	0.90
population risk score	0.72	0.90	0.85	0.70	0.93	0.93

Exhbiti 2: Correlation of Population Risk Components, N = 146

	fetal+neonatal death	low birthweight	infant mortality	late prenatal care	teen birth ratio
low birthweight	0.95				
infant mortality	0.97	0.97			
late prenatal care	0.85	0.92	0.91		
teen birth ratio	0.81	0.85	0.89	0.93	
population risk score	0.95	0.98	0.99	0.96	0.93

Exhibit 3: Factor Analysis for Population Risk Assessments

Predicted Risk Item	Scoring Weight
Infant Mortality Rate	.214
Perinatal (fetal + neonatal) Mortality Rate	.206
Rate of Low Birth Weight (<2,500 grams)	.211
Proportion of Late Prenatal Care	.207
Teenage Birth Ratio	.202

Appendix: Data Sources and Measures

Official birth certificate, fetal death certificate and linked birth-infant death files produced by the Center for Health Statistics were analyzed. A total of 542,572 live births, 4,314 fetal deaths and 3,670 infant deaths to New Jersey residents from 1999 to 2003 were included for our analysis.

Definition of Outcome/MCH Indicator Variables

- Infant Mortality Rate: Number of deaths per every 100 infants during their first 12 months of age.

- Neonatal Mortality: Number of deaths per every 100 live births during the first 27 days after birth.

- Post Neonatal Mortality: Number of deaths per every 100 live births between 28-365 days after birth.

- Perinatal Mortality: Fetal deaths (20 or more weeks of gestation) plus infant deaths (0-27 days after birth) per every 100 neonates (20 or more weeks of gestation to 27 days after birth).

- Fetal Mortality Rate: Fetal deaths with 20 or more weeks of gestation per every 100 still births or live births.

- Low Birth Weight: Births with birthweight of less than 2500 grams.

- Teen birth: Births to women aged 15 to 17 years.

- First Trimester Prenatal care: Deliveries with prenatal care that started during the first three months of pregnancy.

Table 1. Population Perinatal Risk Index and Related Outcome Measures
(Based on births 1999-2003)

Vital Statistics Geo Code	County	Municipality	Total Births	Population Perinatal Risk Index Value	Fetal+ Neonatal (0-27 days) Death Rate	Low Birth Weight (<2500g)	Preterm Birth (<37 wks Gestation)	Infant Mortality Rate	PNC Not in 1st Trimester	Births to Mothers <20 Years Old
0417	CAMDEN	Camden City	8,595	**3.55**	2.1%	11.1%	12.9%	1.6%	44.6%	25.6%
0724	ESSEX	East Orange City	5,845	**2.78**	2.5%	13.5%	14.7%	1.5%	41.6%	14.3%
1306	MONMOUTH	Asbury Park City	1,984	**2.61**	1.8%	10.8%	13.6%	1.2%	33.9%	17.4%
0736	ESSEX	Irvington Township	5,393	**2.59**	2.8%	12.7%	15.1%	1.3%	41.5%	11.6%
1155	MERCER	Trenton City	8,087	**2.54**	2.0%	10.3%	12.3%	1.1%	35.9%	18.3%
0756	ESSEX	Newark City	24,200	**2.53**	2.2%	11.6%	13.9%	1.1%	43.3%	16.0%
0379	BURLINGTON	Willingboro Township	1,755	**2.37**	1.3%	10.1%	10.6%	0.7%	35.8%	14.9%
0172	ATLANTIC	Pleasantville City	1,441	**2.32**	2.3%	9.5%	9.7%	1.0%	43.5%	20.8%
0605	CUMBERLAND	Bridgeton City	2,571	**2.20**	1.7%	9.5%	10.5%	1.2%	38.2%	23.5%
2048	UNION	Plainfield City	4,289	**2.13**	2.0%	9.5%	10.8%	0.9%	45.7%	14.0%
0108	ATLANTIC	Atlantic City	3,794	**2.02**	2.0%	10.1%	10.6%	1.2%	49.1%	17.4%
0768	ESSEX	Orange City	3,007	**1.87**	2.3%	10.4%	12.5%	0.6%	35.2%	10.5%
1242	MIDDLESEX	New Brunswick City	4,952	**1.83**	1.4%	7.8%	11.1%	0.7%	31.1%	16.6%
2056	UNION	Roselle Borough	1,486	**1.54**	2.4%	10.5%	11.3%	1.1%	30.5%	11.5%
0930	HUDSON	Jersey City	17,658	**1.40**	1.8%	9.4%	11.5%	1.0%	28.8%	11.5%
1640	PASSAIC	Paterson City	14,488	**1.38**	1.2%	8.9%	11.2%	0.7%	36.7%	15.4%
0455	CAMDEN	Pennsauken Township	1,988	**1.35**	2.0%	8.2%	10.4%	1.3%	31.0%	14.3%
0445	CAMDEN	Lindenwold Borough	1,413	**1.23**	1.4%	9.2%	10.0%	1.2%	31.9%	11.7%
2024	UNION	Hillside Township	1,374	**1.23**	2.9%	10.4%	11.3%	1.2%	26.3%	7.7%
0349	BURLINGTON	Mount Holly Township	1,125	**1.18**	1.0%	6.1%	8.4%	0.4%	27.5%	15.6%
0655	CUMBERLAND	Millville City	2,210	**1.17**	1.8%	7.1%	7.9%	0.8%	28.6%	16.9%
2012	UNION	Elizabeth City	10,669	**1.10**	1.6%	8.1%	9.3%	0.6%	38.0%	11.7%
0361	BURLINGTON	Pemberton Township	1,607	**1.07**	1.1%	6.8%	8.3%	0.4%	28.1%	15.2%
0680	CUMBERLAND	Vineland City	3,759	**1.07**	1.8%	7.4%	8.8%	1.3%	26.9%	17.3%
1348	MONMOUTH	Long Branch City	2,602	**0.99**	1.2%	6.9%	9.3%	0.7%	20.1%	12.7%
1364	MONMOUTH	Neptune Township	1,705	**0.98**	2.1%	7.8%	11.6%	0.8%	17.7%	11.0%
1635	PASSAIC	Passaic City	7,528	**0.96**	1.2%	6.3%	8.5%	0.8%	37.4%	14.3%
0222	BERGEN	Englewood City	1,630	**0.86**	1.2%	5.8%	7.0%	0.6%	16.5%	6.0%
1248	MIDDLESEX	Perth Amboy City	4,197	**0.83**	1.9%	6.8%	8.1%	1.2%	40.3%	15.0%
0824	GLOUCESTER	Glassboro Borough	1,080	**0.80**	1.7%	8.2%	10.0%	0.8%	27.9%	12.4%
2052	UNION	Rahway City	1,681	**0.64**	1.7%	6.4%	8.3%	0.9%	23.2%	7.3%
2032	UNION	Linden City	2,336	**0.61**	2.4%	7.9%	9.8%	1.2%	23.9%	7.2%
0473	CAMDEN	Winslow Township	2,629	**0.52**	1.5%	6.7%	8.0%	1.0%	19.4%	8.3%
0950	HUDSON	Union City	5,251	**0.45**	1.1%	5.5%	7.5%	0.7%	28.9%	10.9%
0234	BERGEN	Hackensack City	3,153	**0.42**	1.7%	7.5%	9.4%	1.0%	24.8%	6.2%

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0960	HUDSON	West New York Town	3,287	0.38	1.2%	5.2%	8.0%	0.6%	26.5%	9.8%
1372	MONMOUTH	Red Bank Borough	1,194	0.37	0.9%	4.7%	6.6%	0.6%	21.2%	9.1%
1418	MORRIS	Dover Town	1,781	0.31	1.2%	4.7%	6.8%	0.7%	19.6%	7.8%
0144	ATLANTIC	Hamilton Township	1,431	0.27	0.8%	5.8%	6.9%	0.8%	23.8%	9.2%
1332	MONMOUTH	Freehold Borough	1,592	0.26	0.9%	5.0%	7.6%	0.4%	22.6%	8.0%
1206	MIDDLESEX	Carteret Borough	1,283	0.25	1.6%	7.5%	8.2%	1.3%	27.9%	7.6%
1816	SOMERSET	Bound Brook Borough	1,011	0.22	1.4%	5.7%	8.3%	0.6%	26.3%	6.3%
1860	SOMERSET	North Plainfield Borough	1,801	0.21	0.9%	6.1%	7.3%	0.3%	28.3%	5.9%
0905	HUDSON	Bayonne City	3,501	0.20	1.1%	6.5%	8.1%	0.6%	14.7%	6.9%
0148	ATLANTIC	Hammonton Town	1,094	0.19	1.3%	5.4%	9.1%	0.8%	23.3%	8.8%
1110	MERCER	Ewing Township	1,386	0.14	1.3%	7.0%	8.7%	0.9%	15.2%	4.8%
0752	ESSEX	Montclair Township	2,172	0.12	1.7%	6.0%	7.7%	0.7%	15.3%	3.6%
1876	SOMERSET	Somerville Borough	1,067	0.10	1.0%	5.5%	8.3%	1.0%	22.2%	6.2%
1272	MIDDLESEX	South River Borough	1,041	0.09	1.2%	6.2%	8.2%	0.4%	15.0%	5.9%
1836	SOMERSET	Franklin Township	4,287	0.05	1.1%	6.6%	9.0%	0.6%	11.4%	3.9%
0230	BERGEN	Garfield City	1,965	0.04	0.9%	5.5%	7.4%	0.5%	26.0%	6.8%
2076	UNION	Union Township	2,946	0.01	2.0%	6.8%	8.7%	0.9%	14.7%	3.7%
0940	HUDSON	North Bergen Township	3,696	0.01	0.9%	5.2%	7.3%	0.5%	21.3%	6.5%
1446	MORRIS	Morristown Town	1,958	-0.05	0.6%	4.7%	7.3%	0.6%	16.8%	5.1%
0925	HUDSON	Hoboken City	1,532	-0.08	0.7%	5.1%	7.7%	0.3%	13.9%	8.0%
0286	BERGEN	Teaneck Township	2,081	-0.10	1.5%	5.5%	7.0%	0.5%	13.7%	3.5%
0935	HUDSON	Kearny Town	2,288	-0.11	1.2%	6.1%	7.4%	0.7%	20.1%	5.6%
0844	GLOUCESTER	Monroe Township	1,753	-0.12	1.5%	6.2%	9.0%	1.0%	20.0%	6.9%
0744	ESSEX	Maplewood Township	1,594	-0.13	0.9%	6.0%	7.5%	0.4%	15.1%	3.0%
0313	BURLINGTON	Burlington Township	1,315	-0.14	1.6%	5.9%	7.4%	0.6%	14.1%	4.3%
1245	MIDDLESEX	North Brunswick Township	2,646	-0.14	1.0%	6.4%	9.1%	0.3%	12.3%	3.0%
0431	CAMDEN	Gloucester Township	2,438	-0.15	1.6%	6.5%	8.0%	0.8%	17.7%	6.6%
0128	ATLANTIC	Egg Harbor Township	2,160	-0.16	0.8%	5.9%	6.8%	0.5%	21.6%	6.6%
0704	ESSEX	Belleville Township	2,322	-0.17	1.2%	6.3%	8.0%	0.3%	17.7%	4.8%
0140	ATLANTIC	Galloway Township	1,410	-0.19	1.6%	4.2%	6.6%	0.5%	17.0%	6.1%
1251	MIDDLESEX	Piscataway Township	3,166	-0.20	1.2%	5.9%	7.6%	0.6%	13.4%	3.3%
1610	PASSAIC	Clifton City	4,675	-0.20	0.8%	5.4%	7.7%	0.5%	21.3%	4.9%
1530	OCEAN	Lakewood Township	9,896	-0.20	0.7%	4.0%	4.6%	0.3%	26.6%	5.4%
1322	MONMOUTH	Eatontown Borough	1,019	-0.20	1.1%	5.7%	7.6%	0.7%	13.3%	4.1%
0708	ESSEX	Bloomfield Township	2,855	-0.21	1.4%	6.6%	8.2%	0.9%	15.2%	4.0%

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0204	BERGEN	Bergenfield Borough	1,391	-0.21	0.7%	5.9%	8.2%	0.5%	13.2%	3.4%
0209	BERGEN	Cliffside Park Borough	1,170	-0.26	1.0%	5.1%	7.4%	0.6%	18.7%	2.9%
0266	BERGEN	Palisades Park Borough	1,123	-0.26	1.2%	4.2%	5.1%	0.6%	17.0%	2.2%
0245	BERGEN	Lodi Borough	1,534	-0.26	1.1%	6.8%	8.5%	0.7%	17.3%	3.0%
0808	GLOUCESTER	Deptford Township	1,044	-0.27	1.0%	6.3%	9.2%	0.4%	19.8%	5.9%
0341	BURLINGTON	Maple Shade Township	1,085	-0.27	0.6%	5.4%	7.0%	0.5%	18.5%	5.1%
0788	ESSEX	West Orange Township	3,016	-0.27	1.3%	6.2%	8.5%	0.7%	14.4%	2.8%
1356	MONMOUTH	Matawan Borough	1,148	-0.32	0.9%	5.7%	8.1%	0.5%	12.8%	4.4%
1115	MERCER	Hamilton Township	4,486	-0.33	1.4%	5.9%	8.5%	0.6%	15.3%	4.8%
1260	MIDDLESEX	Sayreville Borough	2,858	-0.39	1.2%	6.0%	8.0%	0.6%	13.3%	2.4%
1269	MIDDLESEX	South Plainfield Borough	1,305	-0.42	1.2%	5.0%	6.9%	0.8%	14.5%	2.8%
1510	OCEAN	Berkeley Township	1,171	-0.43	1.4%	5.3%	6.6%	0.5%	11.1%	7.2%
1278	MIDDLESEX	Woodbridge Township	5,990	-0.47	1.0%	6.6%	7.7%	0.5%	14.9%	2.6%
0217	BERGEN	Elmwood Park Borough	1,050	-0.47	0.8%	5.1%	7.3%	0.3%	14.3%	3.1%
1135	MERCER	Lawrence Township	1,664	-0.49	1.1%	5.0%	6.3%	0.5%	11.8%	2.0%
1366	MONMOUTH	Ocean Township	1,543	-0.51	0.8%	6.9%	8.9%	0.3%	10.2%	2.5%
0469	CAMDEN	Voorhees Township	1,269	-0.52	1.7%	6.4%	7.2%	0.8%	15.6%	3.1%
0425	CAMDEN	Cherry Hill Township	2,758	-0.52	1.5%	4.8%	5.8%	0.9%	14.8%	2.5%
1514	OCEAN	Dover Township	4,936	-0.52	0.9%	5.4%	7.6%	0.4%	11.8%	4.7%
1227	MIDDLESEX	Old Bridge Township	2,763	-0.53	1.1%	5.2%	8.2%	0.4%	10.7%	2.7%
1257	MIDDLESEX	Edison Township	6,995	-0.54	0.9%	6.1%	7.7%	0.4%	12.8%	2.1%
1105	MERCER	East Windsor Township	1,649	-0.55	1.6%	5.4%	6.2%	0.3%	9.9%	2.9%
0840	GLOUCESTER	Mantua Township	1,307	-0.56	1.5%	4.9%	7.1%	0.7%	15.2%	4.0%
0227	BERGEN	Fort Lee Borough	1,582	-0.57	0.6%	4.0%	5.4%	0.2%	13.5%	0.9%
0351	BURLINGTON	Mount Laurel Township	2,049	-0.59	1.5%	5.1%	6.1%	0.6%	11.8%	2.7%
0872	GLOUCESTER	Washington Township	1,765	-0.62	1.3%	4.9%	6.6%	0.7%	13.5%	3.6%
1562	OCEAN	Stafford Township	1,275	-0.66	1.2%	4.7%	6.4%	0.7%	10.1%	5.2%
1266	MIDDLESEX	South Brunswick Township	2,684	-0.67	0.9%	5.4%	7.1%	0.4%	7.1%	1.6%
1524	OCEAN	Jackson Township	3,014	-0.68	0.7%	4.8%	8.2%	0.3%	9.7%	3.5%
1512	OCEAN	Brick Township	4,378	-0.68	0.8%	5.2%	7.5%	0.4%	9.9%	3.8%
1254	MIDDLESEX	Plainsboro Township	1,480	-0.69	0.5%	5.8%	6.5%	0.3%	7.2%	0.6%
1526	OCEAN	Lacey Township	1,353	-0.69	0.7%	5.1%	7.4%	0.6%	8.6%	4.4%
1458	MORRIS	Parsippany-Troy Hills Townshi	2,790	-0.70	1.0%	5.1%	6.8%	0.5%	8.1%	1.3%
1215	MIDDLESEX	East Brunswick Township	2,510	-0.71	1.0%	4.9%	7.9%	0.6%	6.4%	1.3%
1988	SUSSEX	Vernon Township	1,113	-0.71	1.1%	4.1%	6.1%	0.7%	8.9%	2.3%

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1675	PASSAIC	West Milford Township	1,613	**-0.75**	1.4%	5.0%	7.4%	0.6%	5.3%	2.4%
1333	MONMOUTH	Freehold Township	1,576	**-0.77**	0.7%	3.5%	6.9%	0.4%	9.6%	2.2%
1338	MONMOUTH	Howell Township	2,977	**-0.77**	0.9%	4.4%	7.3%	0.4%	8.3%	2.6%
1454	MORRIS	Mount Olive Township	1,967	**-0.78**	0.7%	4.6%	6.5%	0.7%	8.5%	1.3%
0764	ESSEX	Nutley Township	1,406	**-0.78**	0.6%	5.0%	8.8%	0.5%	9.0%	1.4%
1370	MONMOUTH	Hazlet Township	1,111	**-0.80**	1.4%	4.8%	7.6%	0.9%	8.4%	2.3%
1844	SOMERSET	Hillsborough Township	2,635	**-0.80**	0.8%	4.5%	7.0%	0.4%	7.8%	1.6%
1620	PASSAIC	Hawthorne Borough	1,121	**-0.80**	1.2%	4.5%	7.8%	0.5%	10.2%	2.1%
1472	MORRIS	Roxbury Township	1,551	**-0.81**	1.0%	4.2%	6.3%	0.5%	6.1%	1.8%
2064	UNION	Scotch Plains Township	1,562	**-0.82**	1.2%	4.9%	6.9%	0.4%	6.6%	1.2%
0225	BERGEN	Fair Lawn Borough	1,400	**-0.82**	1.0%	4.1%	6.5%	0.5%	9.9%	0.7%
1550	OCEAN	Point Pleasant Borough	1,071	**-0.83**	1.0%	5.2%	8.0%	0.6%	8.3%	2.6%
0267	BERGEN	Paramus Borough	1,009	**-0.83**	1.0%	4.5%	6.4%	0.3%	8.7%	1.2%
0327	BURLINGTON	Evesham Township	2,551	**-0.83**	1.3%	5.1%	5.4%	0.7%	11.8%	1.8%
1670	PASSAIC	Wayne Township	2,770	**-0.83**	0.8%	4.7%	6.6%	0.5%	7.7%	0.8%
1428	MORRIS	Jefferson Township	1,223	**-0.84**	1.3%	4.8%	6.3%	0.8%	6.1%	1.3%
1824	SOMERSET	Bridgewater Township	2,977	**-0.84**	0.8%	3.9%	6.1%	0.3%	7.8%	1.5%
0247	BERGEN	Mahwah Township	1,422	**-0.87**	1.0%	4.6%	6.6%	0.4%	6.9%	1.4%
1239	MIDDLESEX	Monroe Township	1,002	**-0.88**	0.9%	3.4%	7.4%	0.8%	4.3%	1.5%
1165	MERCER	West Windsor Township	1,071	**-0.88**	0.6%	3.0%	4.5%	0.5%	4.5%	1.2%
0343	BURLINGTON	Medford Township	1,092	**-0.89**	1.1%	3.6%	6.2%	0.8%	10.0%	1.7%
2072	UNION	Summit City	1,684	**-0.90**	0.8%	3.7%	6.6%	0.7%	4.4%	1.0%
1358	MONMOUTH	Middletown Township	3,428	**-0.90**	1.1%	3.8%	6.5%	0.4%	6.4%	1.7%
1464	MORRIS	Randolph Township	1,724	**-0.90**	0.7%	4.9%	6.2%	0.5%	4.5%	1.2%
1434	MORRIS	Madison Borough	1,030	**-0.91**	0.1%	3.1%	5.4%	0.2%	5.0%	1.2%
1350	MONMOUTH	Manalapan Township	1,451	**-0.91**	1.4%	5.9%	7.6%	0.4%	5.9%	1.1%
1470	MORRIS	Rockaway Township	1,114	**-0.91**	1.4%	5.2%	6.5%	0.2%	5.0%	1.3%
1442	MORRIS	Montville Township	1,328	**-0.91**	0.8%	5.6%	6.9%	0.6%	8.0%	1.0%
1354	MONMOUTH	Marlboro Township	1,914	**-0.94**	0.9%	4.0%	5.1%	0.2%	6.1%	0.5%
1856	SOMERSET	Montgomery Township	1,120	**-0.95**	0.9%	3.6%	6.4%	0.4%	3.9%	0.6%
1474	MORRIS	Washington Township	1,003	**-0.95**	0.6%	3.4%	4.0%	0.1%	4.2%	0.8%
1063	HUNTERDON	Raritan Township	1,192	**-0.95**	0.3%	2.6%	4.0%	0.1%	9.1%	1.4%
1972	SUSSEX	Sparta Township	1,186	**-0.96**	0.6%	3.7%	6.1%	0.3%	6.8%	1.3%
1392	MONMOUTH	Wall Township	1,174	**-0.97**	0.5%	4.5%	8.6%	0.3%	5.4%	1.6%
0273	BERGEN	Ridgewood Village	1,534	**-0.97**	0.7%	3.1%	5.3%	0.1%	6.3%	0.7%

Table 1. Population Perinatal Risk Index and Related Outcome Measures
(Based on births 1999-2003)

Vital Statistics Geo Code	County	Municipality	Total Births	**Population Perinatal Risk Index Value**	Fetal+ Neonatal (0-27 days) Death Rate	Low Birth Weight (<2500g)	Preterm Birth (<37 wks Gestation)	Infant Mortality Rate	PNC Not in 1st Trimester	Births to Mothers <20 Years Old
1416	MORRIS	Denville Township	1,085	**-1.00**	0.9%	4.0%	5.2%	0.3%	4.5%	0.7%
2080	UNION	Westfield Town	2,015	**-1.01**	1.0%	3.6%	5.3%	0.4%	4.5%	0.8%
2008	UNION	Cranford Township	1,419	**-1.01**	0.9%	4.2%	6.5%	0.3%	5.0%	0.9%
1808	SOMERSET	Bernards Township	1,739	**-1.03**	0.8%	3.2%	5.4%	0.3%	4.1%	0.3%
0740	ESSEX	Livingston Township	1,585	**-1.07**	0.8%	4.4%	5.8%	0.1%	5.5%	0.3%
0748	ESSEX	Millburn Township	1,090	**-1.08**	0.7%	4.2%	6.7%	0.2%	6.5%	0.1%